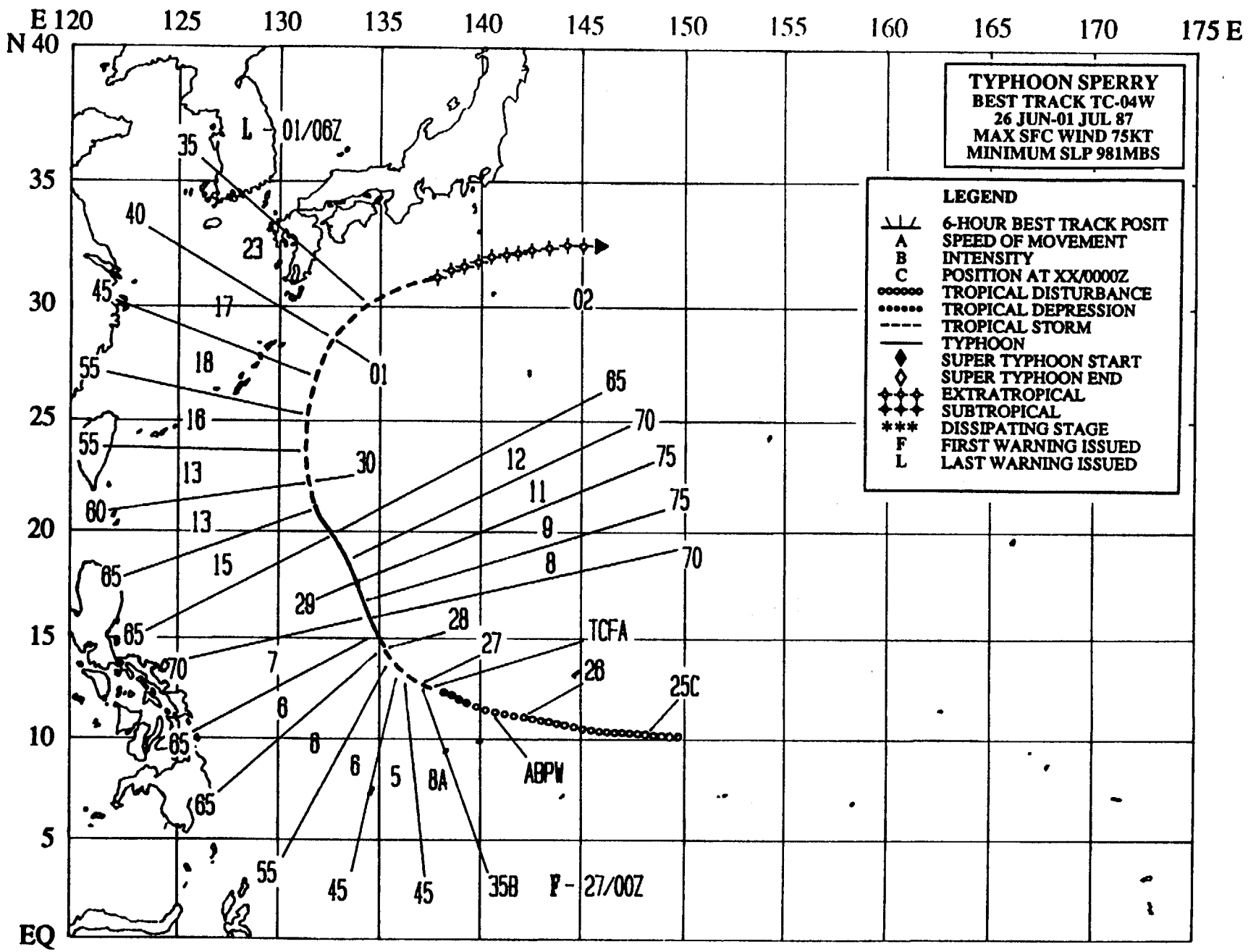
TYPHOON SPERRY
BEST TRACK TC-04W
26 JUN-01 JUL 87
MAX SFC WIND 75KT
MINIMUM SLP 981MBS
LEGEND
6-HOUR BEST TRACK POSIT
SPEED OF MOVEMENT
INTENSITY
POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
E 120
125
130
135
140
145
150
155
160
165
170
175 E
N 40
35
30
25
20
15
10
5
EQ
L - 01/06Z
TCFA
ABPW
F - 27/00Z

TYPHOON SPERRY (04W)

Typhoon Sperry was the second tropical cyclone to reach typhoon intensity and also the second "midget" typhoon in 1987. It was also the season's first to enter the mid-latitude westerlies and recurve toward the northeast.

The tropical disturbance that eventually developed into Typhoon Sperry was first detected by synoptic data on 24 June as a broad, weak surface circulation in the western extension of the monsoon trough 200 nm (370 km) to the northwest of the island of Truk in the eastern Caroline Islands. The convection in this area appeared to be random. At the same time, a second area of disorganized convection was developing 210 nm (389 km) east of the island of Enewetak in the Marshalls. To the north and east, a Tropical Upper-Tropospheric Trough (TUTT) extended from Wake Island southwestward to just northeast of Guam. The broad subtropical ridge dominated the low-level flow pattern in the northwest Pacific. Although the two convective areas consolidated on 25 June, the resultant disturbance still struggled for two more days before reaching tropical storm intensity. The most probable cause for this slow intensification was the close proximity of a TUTT low (Sadler, 1979) to the northeast. This low aloft, in conjunction with the lower

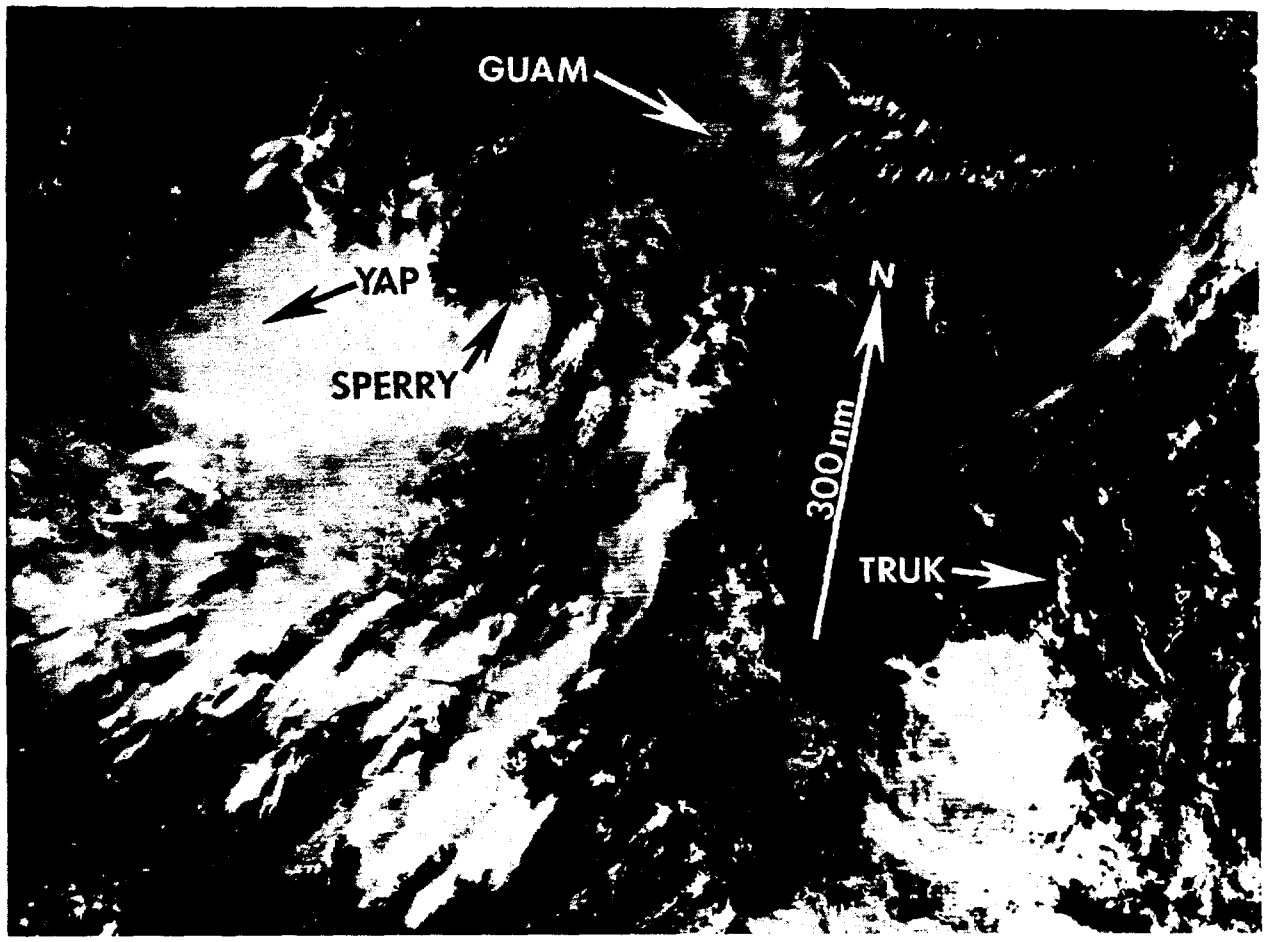

Figure 3-04-1. Visual satellite imagery showing the tropical disturbance that would later develop into Typhoon Sperry. Note the low-level circulation center displaced to the northeast of the main convection (252347Z June DMSP visual imagery).

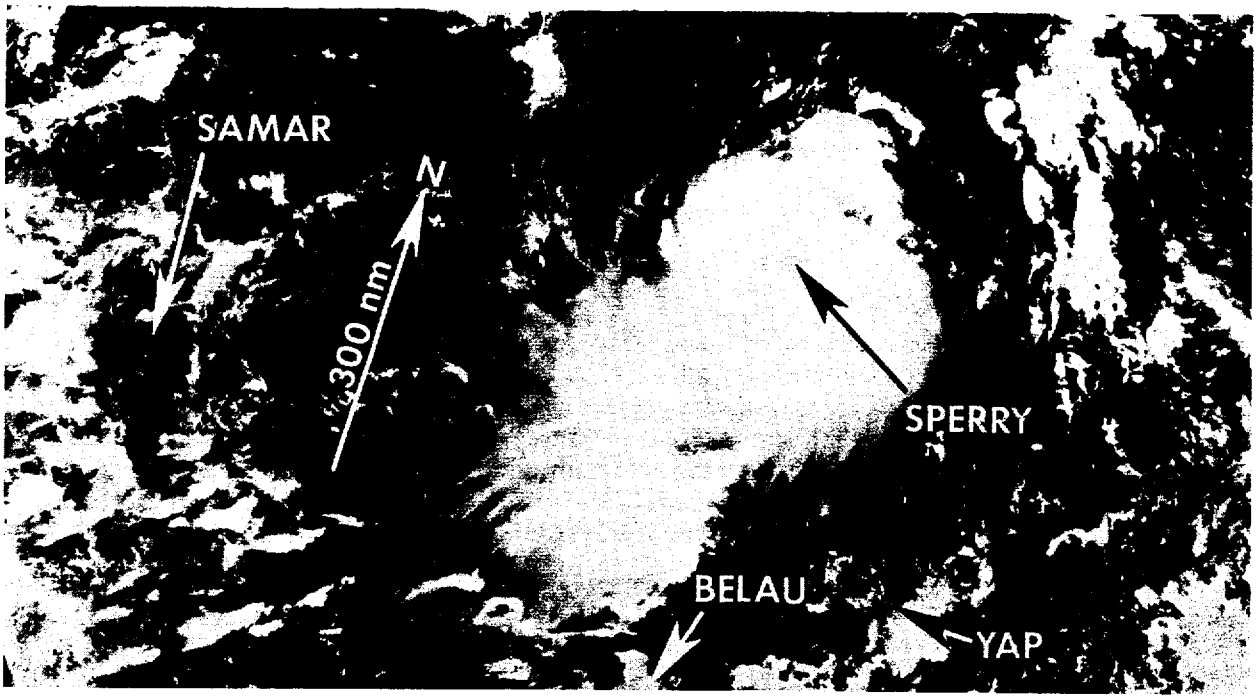

Figure 3-04-2. Typhoon Sperry with an intensity of 65 kt (33 m/sec) just prior to peaking (280047Z June DMSP visual imagery).

tropospheric subtropical ridge, created an area of strong vertical wind shear (Figure 3-04-1).

The low-level disturbance drifted west-northwestward for the next several days. At that point, the separation between the TUTT low, or cell, and the low-level tropical disturbance to the southwest remained static. However, an interesting change occurred aloft. By 251200Z a plume of dense cirrus, associated with a 55 kt (28 m/sec) wind maximum entering the western side of the upper cold low from the north, moved southward. Within eighteen-hours the cirrus plume had plunged into the southwest portion of the TUTT cell. The cell responded. The circulation within the core of the upper low tightened up and became more symmetrical. This, in turn, reduced the vertical wind shear across the system and as a result, the central convection started to increase within the low-level disturbance again. Earlier (at 241200Z), the Navy Operational Global Atmospheric Prediction System upper-air prognoses, had correctly forecast this lessening of vertical shear. The new convection was initially mentioned on the 260600Z Significant Tropical Weather Advisory (ABPW PGTW).

Based upon satellite intensity analysis (Dvorak,1984) of satellite imagery between 1500Z and 2100Z on the 26th, analysts of Detachment 1, 1st Weather Wing estimated that the disturbance had 30 kt (15 m/sec) surface winds, based on more organized and intense convection. The satellite reconnaissance inputs prompted the issuance of a Tropical Cyclone Formation Alert (TCFA) at 262230Z. An aircraft reconnaissance investigative mission was requested for the following day. At the time of the TCFA, synoptic data was not available near the center of the disturbance. However, surface data on the periphery of the disturbance implied that at least a 10 kt (5 m/sec) low-level circulation was present. The only reported stronger wind was the gradient-level (3000 ft (914 m)) report at Yap (WMO 91413), which increased from 10 kt (5 m/sec) at 261200Z to 15 kt (8 m/sec) at 270000Z as the disturbance passed northeast of the island on the 26th.

The first warning on Tropical Storm

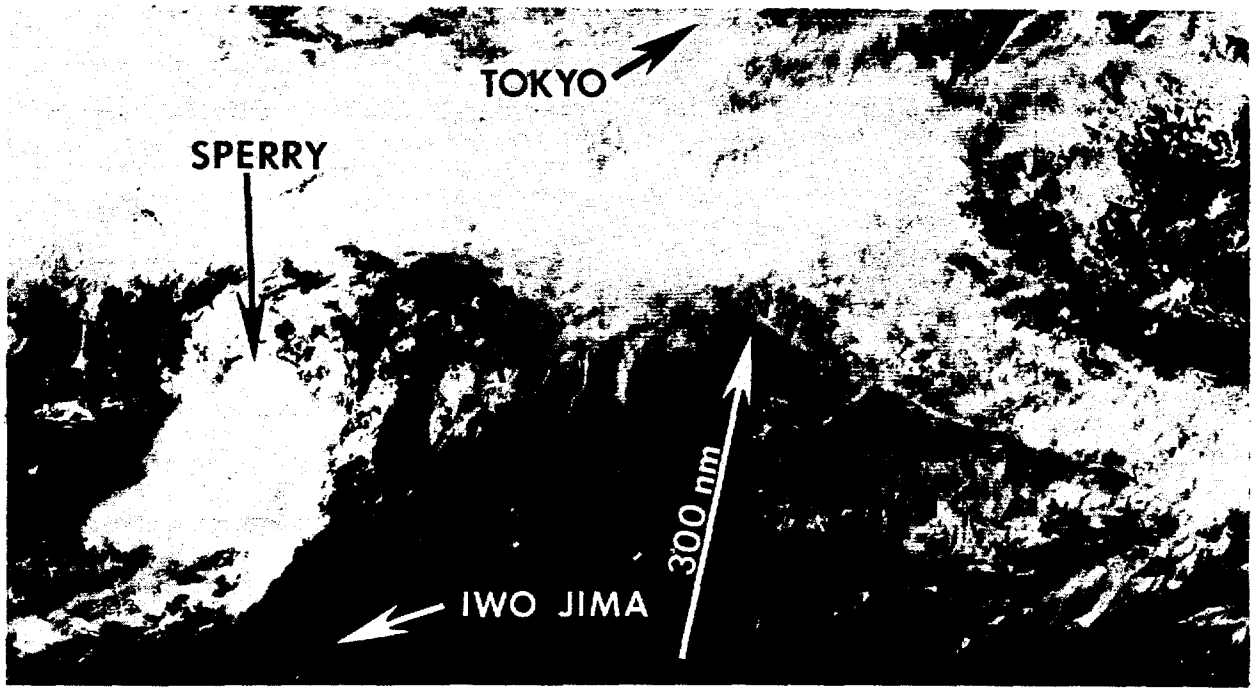

Figure 3-04-3. Sperry interacting with a frontal boundary south of Japan (302345Z June DMSP visual imagery).

Sperry was issued on the 27th, valid at 0000Z, after visual satellite imagery showed that a central dense overcast and 35 kt (18 m/sec) maximum sustained surface winds were present. Aircraft reconnaissance later in the day located a 1001 mb circulation center with 40 kt (21 m/sec) maximum sustained surface winds, extending out to 50 nm (93 km) southeast of the center. Initial forecasts called for Sperry to follow an around-the-ridge scenario and recurve. This forecast philosophy proved to be correct.

Sperry attained typhoon intensity 24-hours later at about 280000Z. The Aerial Reconnaissance Weather Officer reported Sperry as very compact, with 70 kt (36 m/sec) maximum sustained surface winds surrounding a small, circular 15 nm (28 km) diameter eye. The eye was open to the north and had a minimum sea-level pressure of 983 mb. Sperry developed a ragged eye while moving northwestward under the influence of the mid-level steering flow around the western periphery of the subtropical ridge. Its intensity peaked at 75 kt (39 m/sec) between 281200Z and 281800Z (Figure 3-04-2). This set the stage for Typhoon Sperry's final phase.

By 290000Z, with a frontal boundary and associated mid-latitude trough moving eastward across southern Japan, a recurvature scenario appeared most probable. JTWC incorporated this into the warnings and called for recurvature in 48-hours. Sperry came under the influence of the mid-latitude westerlies and recurved passing 175 nm (324 km) to the east of the island of Okinawa in the Ryukyu Island chain.

After recurvature, Sperry started a gradual acceleration toward the northeast. By 1800Z on the 30th, the intense central convection became displaced south-southwest of the low-level circulation center. A steady decrease in cloud organization and intensity followed. Figure 3-04-3 shows the proximity of the frontal boundary and effect of the strong vertical wind shear on the remaining convection. The final warning was issued as Sperry transitioned to extratropical at 010600Z.

After completing extratropical transition, the low-level circulation drifted eastward embedded in the frontal boundary. There were no reports of lives lost or damage to shipping due to Typhoon Sperry.